

SECTION III—REMARKS

This amendment is submitted in response to the final Office Action mailed November 18, 2005. Claims 1, 9 and 17 are amended, and claims 1-24 remain pending in the application. Applicant respectfully requests reconsideration of the application and allowance of all pending claims in view of the above amendments and the following remarks.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 1-24 under 35 U.S.C. § 103(a) as obvious in view of, and therefore unpatentable over, U.S. Patent No. 6,507,093 to Kameda et al ("Kameda") in view of Applicant's allegedly admitted prior art. Applicant respectfully traverses the Examiner's rejections. To establish a *prima facie* case of obviousness, three criteria must be met: (1) the prior art references must teach or suggest all the claim limitations; (2) some suggestion or motivation to combine the references must be found in the prior art; and (3) there must be a reasonable expectation of success. MPEP § 2143. As explained below, Applicant respectfully submits that the Examiner has not established a *prima facie* case of obviousness.

Claim 1, as amended, recites an apparatus combination including a film bulk acoustic resonator (FBAR) comprising a piezoelectric membrane having a portion thereof sandwiched between a first electrode and a second electrode, the piezoelectric membrane being suspended from at least two edges thereof, and a heat transfer layer placed on the piezoelectric membrane "substantially surrounding, but not in electrical contact with," the first electrode. Applicant's allegedly admitted prior art discloses an FBAR, but the Examiner concedes that it does not disclose that the FBAR includes a heat transfer layer.

Nonetheless, the Examiner alleges that Kaneda discloses a semiconductor device wherein the heat transfer layer is not in contact with the electrodes. Specifically, the Examiner points to Figure 9 of Kaneda and alleges that heat sink 5 surrounds electrodes 7a, 7b, 8a and 8b. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a heatsink surrounding, but not in contact with, the electrodes for the purpose of minimizing the risk of a short circuit.

Applicant respectfully disagrees. Even if the Examiner's characterization of Kaneda is correct, which Applicant does not concede, Kaneda cannot disclose a combination including the claimed limitation because there is electrical contact between the heat sink 5 and the electrodes 7 and 8. Why? Kaneda implicitly discloses that the entire lead frame shown in Figure 9 is made of a single piece of electrically conductive material, for several reasons: (i) Kaneda shows the different portions of the lead frame—band-shaped members 2 and 3, heat sinks 5, electrodes 7 and 8 and coupling strips 6—are all contiguous; (ii) no seams are shown between these different portions; (iii) all portions have the same cross-hatching; (iv) there is no disclosure or suggestion that the different portions are made of different materials; and (v) making the entire lead frame from a single piece, such as by stamping it from a sheet of metal, is the only feasible way of making such an assembly. With the lead frame made of a single conductive material, coupling strips 6 and band-shaped members 3 necessarily create electrical contact between electrodes 7 and 8 and heat sinks 5. The combination of Applicant's allegedly admitted prior art and Kaneda therefore cannot disclose, teach or suggest a combination including a heat transfer layer "substantially surrounding, but not in electrical contact with," the first

electrode. Applicants therefore respectfully request withdrawal of the rejection and allowance of the claim.

Regarding claims 2-8, if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is also non-obvious. MPEP § 2143.03; *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). As discussed above, claim 1 is in condition for allowance. Applicant respectfully submits that claims 2-8 are therefore allowable by virtue of their dependence on an allowable independent claim, as well as by virtue of the features recited therein. Applicant therefore respectfully requests withdrawal of the rejections and allowance of these claims.

Claim 9, as amended, recites an apparatus combination including a plurality of coupled film bulk acoustic resonators (FBARs) on a piezoelectric membrane, each FBAR comprising a portion of the piezoelectric membrane sandwiched between a first electrode and a second electrode, and a heat transfer layer placed on the piezoelectric membrane "substantially surrounding, but not in electrical contact with," the plurality of first electrodes. By analogy to the discussion above for claim 1, Kaneda and Applicant's admitted prior art, taken together, cannot obviate this claim because they do not disclose, teach or suggest every element and limitation of the claim. Applicant submits that claim 9 is therefore allowable and respectfully requests withdrawal of the rejection.

Regarding claims 10-16, if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is also non-obvious. MPEP § 2143.03; *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). As discussed above, claim 9 is in condition for allowance. Applicant respectfully submits that claims 10-16 are therefore allowable by virtue of their dependence on an allowable independent claim, as well as by virtue of the

features recited therein. Applicant therefore respectfully requests withdrawal of the rejections and allowance of these claims.

Claim 17, as amended, recites a system combination including an FBAR coupled to the signal source, the FBAR comprising a piezoelectric membrane having a portion thereof sandwiched between a first electrode and a second electrode, the piezoelectric membrane being suspended from at least two edges thereof, and a heat transfer layer placed on the piezoelectric membrane "substantially surrounding, but not in electrical contact with," the first electrode. By analogy to the discussion above for claim 1, Kaneda and Applicant's allegedly admitted prior art, taken together, cannot obviate this claim because they do not disclose, teach or suggest every element and limitation of the claim. Applicant submits that claim 17 is therefore allowable and respectfully requests withdrawal of the rejection.

Regarding claims 18-24, if an independent claim is non-obvious under 35 U.S.C. § 103, then any claim depending therefrom is also non-obvious. MPEP § 2143.03; *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). As discussed above, claim 17 is in condition for allowance. Applicant respectfully submits that claims 18-24 are therefore allowable by virtue of their dependence on an allowable independent claim, as well as by virtue of the features recited therein. Applicant therefore respectfully requests withdrawal of the rejections and allowance of these claims.

Conclusion

Given the above amendments and accompanying remarks, all claims pending in the application are in condition for allowance. If the undersigned attorney has overlooked a teaching in any of the cited references that is relevant to allowance of the claims the Examiner is requested to specifically point out where such teaching may be found.

Further, if there are any informalities or questions that can be addressed via telephone the Examiner is encouraged to contact the undersigned attorney at (206) 292-8600.


Charge Deposit Account

Please charge our Deposit Account No. 02-2666 for any additional fee(s) that may be due in this matter, and please credit the same deposit account for any overpayment.

Respectfully submitted,

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Date: 1-18-06


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Enclosures: Amendment transmittal, in duplicate